THURSDAY, MAY 20, 1915.

SCIENCE AND THE STATE.

IN the *Chemical News* of April 30 there is a very moderate article emphasising what has been frequently preached in vain: the necessity of a close connection between the public Services and men of science. It is argued that the present is a special opportunity of again advocating the necessity of intimate co-ordination of effort; the societies have ever been willing to render gratuitous service; the Royal Society, for example, has for long put at the disposal of the Government the knowledge and advice of experts in all branches of science. The writer of the article, however, directs attention to the comparative scarcity of young men trained in research, and points out that it is by no means easy for a young graduate to obtain employment otherwise than by teaching. To rectify this state of affairs, he suggests the foundation of research institutes, where such young men could find employment (remunerative, it is to be presumed). These institutes should, it is remarked, be directed by men of eminence in their own branches, free from the irksome duty of teaching. The writer of the article further points out that while the average quality of German research is not high, still its quantity is great; and that British inventiveness is relatively higher. It is questionable whether his statement holds that the result of the German methods of scientific education has been the production of men of resource, men who are able to act promptly and on their own initiative in emergency; this power he believes that we British lack in the present crisis. I do not agree; it is not that power in which we are deficient, but the faculty of organisation, where each man is willing to do only the share which is allotted to him. That is the essential characteristic of the German; he lacks originality, but is content to form a cog in a system of wheels directed from above. Nor are the brains of this human machine original; they have learned how to appropriate and render commercial the ideas of inventors, chiefly those of the non-Germanic nations.

The deputations to Mr. Runciman and Mr. Pease of members of the Royal and the Chemical Societies, and of the Societies of Chemical Industry and Analysts, reported on in NATURE of May 13 (p. 295), urged the appointment of a Standing Committee, serving the purpose of an intelligence department, and also helping the large and growing chemical industries of the country in the same way that the Commercial Intelligence Department serves merchants and traders. It was pointed out that the expansion of the chemical industries of the country requires co-operation between science and manufacturers, and that an increase in the number of research workers is desirable. The speakers also insisted on the need of a more intelligent appreciation of the significance of original scientific work by the Government. To these remarks Mr. Runciman and Mr. Pease made sympathetic replies.

On the evening of the same day on which the report appeared in NATURE, Mr. Pease announced in the House the intention of the Government to create an Advisory Council on Industrial Research—a committee of experts who would be able to consult with other expert committees working in different directions, and associated with leaders of industry. "He was now considering names."

Now, we do not doubt the good will of the members of the Cabinet, but we distrust their judgment in this matter. The handling of the dye scheme was, to say the least of it, very unfortunate. There are two German works, one the Mersey works, a branch of the "Badische," and one at Ellesmere Port, a branch of the German works at Höchst, which might have been associated forcibly with this combine with advantage to the country; moreover, the total lack of chemical talent on the directorate does not argue for its success, as the public has testified by failing to subscribe the issue. The two "eminent chemists" who advised the Government on the dye scheme doubtless do not thank the member of the Cabinet for their unsought publicity. These and other similar instances lead us to mistrust the judgment of Mr. Pease and his colleagues on questions involving science.

There is certainly room for a chemical council, and I had already prepared a draft scheme about two months ago, which has been submitted to, and has had the general approval of, several of our leading industrial chemists. Perhaps it might help were an outline of the scheme to be given here. It is headed "A Draft Scheme of a Chemical Council of State." The clauses are as follow:—

1. The dependence of the welfare of a country on its chemists is obvious. Chemistry lies at the basis of practically all manufactures. Continental nations and the United States have long acknowledged this.

2. Great Britain is behind no nation in the eminence of its chemists. But inducements are lacking to persuade young men to accept minor

positions. Chemical research, as indeed all research, is of two kinds; capital discoveries are made by some, and in this Great Britain probably leads. But the patient development of known ground requires men of a different calibre—men of more ordinary attainments; such men are lacking in numbers in Great Britain.

3. Men of the first rank exist both in the universities and in industry. It is of these that the Chemical Council should consist. About twenty men of this class could easily be named, of the highest reputation and of great experience. Among them every one of the numerous branches of chemistry could be covered; one or more of them would be competent to give expert opinion on every subject which falls within the purview of chemistry.

4. The manufacturing chemists in Great Britain are, generally speaking, not combined. It is true that the alkali-makers work on a mutual understanding; so do the ironmasters. But chemical products are so varied that it may be truly said that industrial chemists work in isolation from each other. It is also generally true that there is little contact between industrial and scientific chemistry. The teachers and students in universities and colleges know little of what passes in the world of manufacture, nor do industrial chemists, as a rule, consult the heads of scientific laboratories. This, again, does not obtain abroad.

5. A Chemical Council for the United Kingdom or for the Empire should comprise both classes of men: scientific investigators and those who apply scientific discoveries to industry. It should contain about twenty-four members, of whom one-third should be technical chemists, one-third scientific investigators, and one-third analytical and consulting chemists.

6. Its duties should be:—

(*a*) To ascertain from every chemical factory in the kingdom (1) the nature of its raw material; (2) the nature and amount of its finished products; (3) the nature of its by-products and what becomes of them. Also to learn by inquiry of the purchasers and users of chemical products—(1) what articles they obtain from home manufacturers; (2) what articles they purchase from abroad; and (3) the causes which induce them to encourage foreign rather than home industries.

(*b*) To establish connection with the chemical laboratories of universities and colleges, and to bring chemical researchers into contact with manufacturers, so that the latter should indicate to the former what problems await solution; and the former should keep the latter posted in any discoveries which appear to promise to be of technical value.

(*c*) To advise the Government on questions involving a skilled knowledge of chemistry and its applications.

7. It would not be desirable to enlist the services of the members of such a committee free of remuneration; a small annual retainer would, however, be sufficient to create a feeling of responsibility. It would, of course, be necessary for the Council to employ agents, who must also be skilled chemists, to carry out such work as visiting factories and interviewing the heads of departments both of factories and colleges; also some clerks and typewriters would be essential.

8. It would make for efficiency if a certain proportion of the members of such a committee were to offer themselves for retirement annually, as do the directors of a company. It would be open to the remaining members to recommend their continuance in office or their replacement by fresh blood. If the Council consisted of twenty-four, eight members might retire each year, with the possibility of re-election.

9. This Council would resemble to some extent a Royal Commission, but it should be appointed for a term of years, say ten, with the possibility of continuance as a permanent body should its work be successful. It must be remembered that the progress of science and its applications has no end.

10. The Committee should report once a year at least, or even at shorter intervals, to the Crown. It would appear advisable not to attach it to any Government department, but to associate it with the Board of Trade, the Board of Agriculture and Fisheries, the Local Government Board, the Board of Education, and also with the Government laboratories.

11. As it is clearly of advantage that such a committee should be non-political, it would be well if it were appointed by and were directly responsible to the Crown.

To whom is the nomination of the first members of such a committee to be entrusted? For on that will depend its success or its failure. I suggest that the President of the Royal Society, himself a most distinguished chemist, should be asked to nominate from the Fellows four persons, two scientific chemists and two technical chemists; and that they, under his chairmanship, should select the names of twenty other persons, themselves constituting four members of the Council. It is unlikely that Sir William Crookes could be prevailed on to add to his numerous onerous duties by himself serving on the Council; but he would probably consent to act as chairman of the electoral committee.

It is earnestly to be hoped that members of the Government will agree to adopt some such scheme. To embark without expert—real expert—advice on nominating the members of such a Council would be to expose it to risks equal to that attending the dye scheme, and would make it impossible to achieve the objects which they appear to have at heart. Let us hope that they will, in this case at least, trust the expert.

Lastly, it is earnestly to be hoped that Mr. Pease's good intentions will not take the form of the institution of a number of Government scholarships. It is grossly unfair to induce young men by scholarships to embark on a career which has little if no outlook; and that has hitherto largely been the case. The status of chemists in Government employment, for example, is not such as to induce any young man who can choose any other profession to devote himself to the career of an official chemist. Compared with other civil servants, he is underpaid and overworked. And although certain manufacturers, to their credit, maintain excellent laboratories, in which a young man has scope to show his ability and may meet with a suitable reward, yet these are the exception. It is to increasing their number and organising their resources that the efforts of the Chemical Council should be devoted.

The suggestion of the foundation of chemical institutes will not meet the case. Those at Dahlem, near Berlin, I am informed at first hand, are not appreciated by the young chemists who work in them; they do not lead to permanent positions. The same cause has resulted in the comparative failure of our Davy-Faraday Institution; and it would be futile to embark on an ambitious scheme for training research chemists without first making sure of their having a reasonable chance of earning a living when they leave.

WILLIAM RAMSAY.

A GREAT PLANT COLLECTOR.

Journal kept by David Douglas during his Travels in North America, 1823–1827. Pp. 364. (London: W. Wesley and Son, 1914.) Price 21*s*. net.

DAVID DOUGLAS, whose journals after lying neglected for nearly ninety years have recently been printed and published by the Royal Horticultural Society, was born near Scone, in Perthshire, in the year 1798. He was apprenticed as a gardener in the Earl of Mansfield's gardens at Scone. When he was about twenty years of age he went to the botanic garden at Glasgow, where at that time the elder Hooker held the position of professor of botany. He became Hooker's assistant and companion during his famous botanical tours in the western Highlands, and showed such a love and enthusiasm for plants that when the Royal Horticultural Society, in quest of a suitable man for a botanical expedition to North America, applied to Hooker, the latter at once recommended Douglas. Douglas accordingly visited the eastern United States and Canada in 1823. His journal describing this trip has but a mild interest, much of the ground he traversed having been already well trodden. He fulfilled his task, however, so much to the satisfaction of the Royal Horticultural Society that, in 1824, he was again dispatched to North America, this time to the western side. By reason of the number of plants he discovered and introduced this journey proved an epoch-making one, both in botany and horticulture. Douglas left Gravesend in July, 1824, and, going by way of the Straits of Magellan, reached the mouth of the Columbia River the following April. After two years' work in Oregon and California he returned by the overland route to York Factory, south of Hudson's Bay, and reached England in October, 1827. He made a second journey to the same regions in 1829, but of this the present volume gives no account.

Douglas stands undoubtedly in the very first rank of plant collectors, having as his compeers such men only as Masson, Allan Cunningham, William Lobb, Robert Fortune, and Wilson. The journals show that he possessed to a high degree those peculiar and diverse qualities that go to make a first-class plant collector—physical courage and endurance, contempt of hardships, a love and knowledge of botany, together with a certain business aptitude and adaptability to new surroundings. He enjoyed the advantage of a practically virgin field for his labours, for scarcely any botanical exploration had been done in this region since Vancouver's voyage of survey some thirty years before, when Archibald Menzies—Vancouver's surgeon and botanist—had made a few excursions near the coast. And not only was his field a virgin one; it comprised the finest sylva of temperate regions, one might even say, of the entire world.

These journals were written in simple style, often apparently after the day's journey was done, with no attempt at literary embellishment and agreeably free from any bombast or undue self-